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West Arm Demonstration Forest, Strategic Plan: Summary

- **To protect the various resource values, "ecosystem management" is the focus in the West Arm Demonstration Forest. One of the key principles of ecosystem management is to maintain a diversity of forest structures, both within stands and across the larger landscape.**
- **The primary intent of the demonstration forest is to manage the landbase in a way that protects the identified resource values, especially water, while applying and testing the newest concepts in forest management in a operational setting.**

the West Arm Demonstration Forest

INTRODUCTION

The West Arm Demonstration Forest—or WADF (*wah-def*) as it is commonly referred to—is in southeastern British Columbia (BC), in a region known as the West Kootenays. It covers 13 500 ha on the north shore of the West Arm of Kootenay Lake, in the Kootenay Lake Forest District (Figure 1).

The area is important for many resource values:

- Numerous *watersheds and springs* that provide drinking and irrigation water.
- High *tourism and recreation* values.
- Significant *timber* volumes.
- Various *wildcrafting* opportunities.
- A large number of *wildlife* species.
- Ecological reserve of *old-growth ponderosa pine*.
- Two spawning channels for Kokanee *salmon*.
- The *viewscape* for the rural communities of Harrop and Procter, and for boaters on the West Arm of Kootenay Lake.

Only about 33% of the total area of WADF is suitable for timber harvesting. The majority of the landbase (66%) is inoperable, mainly because it is too steep, at too high an elevation, or not forested.

In 1998 the WADF Working Committee prepared Version 1 of a strategic plan for managing the demonstration forest, which will be circulated for public review and comment. The plan includes a process for developing an ecosystem management plan for WADF. The synopsis of the draft WADF strategic plan presented here is intended for practitioners.

MANAGEMENT FRAMEWORK

WADF was established by the BC Ministry of Forests in 1992 in response to three issues:

- Public concern about forest management practices in the area.
- The impacts these practices were having practices were having on non-timber resource values.
- The interest of Kootenay Lake Forest District staff in trying new forest management concepts.

The primary intent of this demonstration forest is to manage the landbase in a way that protects the identified resource values, especially water, while applying and testing the newest concepts in forest management in an operational setting. Harvesting and regenerating trees must be consistent with the primary intent.

To protect the various resource values, "ecosystem management" is the focus in WADF. One of the key principles of ecosystem management is to maintain a diversity of forest structures, both within stands and across the larger landscape. Maintenance of diversity allows most of the habitat needs of the native plant and animal species to be met, and protects the resource values that depend on the forest. Many of the concepts of ecosystem management are not new, but simply reflect an improved and more inclusive philosophy of forest management. It is hoped that this new management focus will help improve public support for forest management activities in the area.

WADF is a Small Business Forest Enterprise Program (SBFEP) operating area. Forest management activities are carried out by SBFEP staff under the direction of the WADF Working Committee.

Management Principles and Organization

WADF is managed by a series of committees that provide recommendations, by means of consensus, to the District Manager for implementation.

Forest management activities in WADF are proposed by the WADF Working Committee and then sent to the appropriate local Watershed Committee for review. Watershed Committee members provide comments and recommenda-

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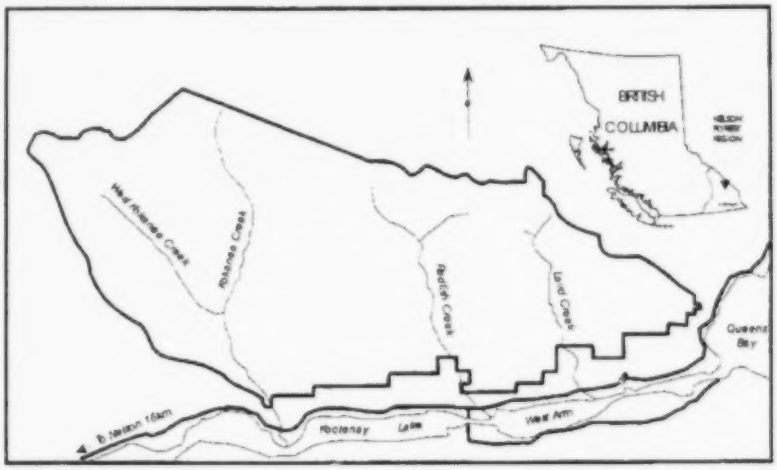

Figure 1. Location of the West Arm Demonstration Forest (WADF) in the Nelson Forest Region in southeastern BC.

tions on the initial proposal, as well as all subsequent phases of activity (e.g. watershed assessments, Silviculture Prescriptions, road works, and harvesting). Decisions and/or recommendations of a Watershed Committee are forwarded to the Working Committee for adoption, or adjudication where consensus is not reached. A consensus agreement by the Working Committee is then recommended to the District Manager for approval.

The Working Committee is guided in its decisions by three main principles:

1. Develop an effective and balanced total resource management plan for WADF, to guide sustainable and balanced resource use.

2. Present a wide range of traditional forestry activities, as well as demonstrate new and innovative forestry techniques.

3. Provide a readily accessible location for a variety of research activities, and apply the findings of research activities through an adaptive management process.

If the Working Committee fails to reach agreement on an issue, the Steering Committee adjudicates and makes recommendations to the District Manager for a final decision. The Steering Committee and District Manager also provide management direction for WADF.

Public Participation

A public participation process has been developed for WADF. The objectives of this process are to:

- Involve stakeholders and the general public, on a consultative and participatory basis, in planning and operating WADF (e.g. Watershed Committees, Working Committee).
- Enable other area residents and the general public to review and comment at the strategic planning level.
- Seek new and more effective ways of public participation.

Research

Our knowledge of ecosystem management is increasing rapidly. Because research occurs in conjunction with operational activities at WADF, it is an ideal site for applying the most up-to-date information, and testing new ideas. This approach allows the SBFEP in the Kootenay Lake Forest District to have a direct opportunity to practice innovative forestry techniques.

Through the application, testing, and demonstration of new forest management principles and practices, WADF will become a showcase for innovative forestry techniques, as well as a source of much new information about how to manage the full range of forest resource values.

A number of research activities are currently under way at various locations throughout WADF. For example, the Research Section of the Nelson Forest Region has water-monitoring stations set up on Laird and Redfish Creeks which will allow comparisons between undeveloped and developed drainages. Data collection includes suspended sediment levels, turbidity, streamflow, climate information, and snow accumulation/depletion rates. Researchers are encouraged to develop project proposals and direct them to the Working Committee.

PLANNING PROCESS

Landscape-Level Planning

Planning at the landscape level recognizes that some effects of timber harvesting spread far beyond cutblock boundaries, and even beyond the boundaries of a single watershed. For instance, some wildlife species have large home ranges that may span several watersheds; therefore, travel corridors must be available within and between watersheds.

The system of landscape planning currently used in WADF is called total resource design (TRD) and was initiated in 1993. TRD is an ecosystem-based planning process that combines both ecological and visual landscape considerations. It assumes that all native species and ecological processes are more likely to be maintained if managed forests are made to resemble those forests created by natural disturbance agents such as fire, wind, insects, and disease. TRD was adopted in WADF because it relates directly to the intent of forest management activities in the demonstration forest.

Landscape Ecological Analysis

One of the key components of TRD is the landscape eco-

logical analysis. This analysis provides information about the landscape of WADF as an ecological system, in terms of structure, function, processes, and context within the larger landscape. The objective of the ecological analysis is to divide the landscape into ecologically similar units.

The analysis looks at current forest structures and tries to determine the factors that influenced forest development. This helps develop an understanding of the type of forest management activities that can be used to mimic nature by retaining the same type of forest structures throughout the area. It is assumed that if management activities mimic natural disturbances, all species present in a natural landscape will also be present in a managed one.

Visual Landscape Design

A second key component of TRD is visual landscape design. The objectives for visual design in WADF are to:

- Retain a high standard of visual integrity while managing for all forest resources.
- Create a diverse visual landscape—through the use of varying silvicultural systems—that suits the topography and character of the area.

Landscape Design

Completing the TRD process involves the actual design of treatment units based on the ecological and visual information. For WADF, the design process can be divided into two steps:

1. Delineation of a forest ecosystem network (FEN) to protect essential riparian habitats and linkages in the landscape. This assists in the maintenance of biodiversity at a landscape level and is an essential initial step in the landscape design process.

The FEN in WADF incorporates the main watercourses and lands immediately adjacent to them in relatively long, narrow corridors that connect lower elevation areas with higher elevation ones. Corridors assist the movement of wildlife, plants, and other organisms throughout the landscape.

2. Delineation of landscape design units and pattern objectives for remaining areas. Nine landscape pattern categories were formulated for WADF, based on naturally occurring disturbances, etc. Design units were delineated based on these categories as well as forest cover, topography, etc. This ultimately helps identify which silvicultural system(s) should be used in each of the design units because the landscape pattern objectives become the goals for designing stand-level forest management activities for each unit.

Each design unit is characterized by a landscape pattern category. The description for each category presents the predominant natural ecosystem characteristics found in the category, and provides suggestions for management activities and designs that might be appropriate.

Further analysis, supported by computer modelling, is undertaken to determine a sustainable harvest level and a harvest schedule for WADF.

STAND-LEVEL MANAGEMENT

Stand-level management practices and prescriptions are guided by landscape-level objectives for WADF, including the need to protect other forest values. They will accommodate, to the greatest degree possible, the design unit and landscape pattern objective recommendations developed in the TRD. The objectives of stand-level management are to:

- Explore and demonstrate a broad range of silvicultural systems, harvest methods, regeneration, and site-preparation techniques across the landscape.
- Assess the economics, and ecological and social feasibility, of a variety of silvicultural systems.

This approach emphasizes retaining trees and patches of forest in a managed forest to protect a variety of values and ecosystem components. Ideally, the retained trees and/or patches will create forest characteristics similar to patterns and remnant structures left after natural disturbances (see Figure 2).

Some key stand-level attributes are:

- Species composition: avoid practices that favour fewer tree species.
- Wildlife trees: retain individually, and in patches containing both live and dead trees within cutblock boundaries.
- Coarse woody debris (CWD): leave a variety of non-merchantable trees in various diameter classes scattered throughout a block, similar to what is found in adjacent unlogged stands.
- Stand size and distribution: use a range of harvest unit sizes and distribution patterns to approximate the mosaic created by natural disturbances.

Forest Health

Certain levels of pest populations are normal (endemic levels) for any forest landscape, and are a component of forest biodiversity. It is likely these populations are required in the long term for the general health and functioning of the ecosystem. The challenge at WADF will be to maintain populations of native forest pests at endemic levels, i.e. not allow pests to become epidemic.

WADF intends to take an ecosystem-centered view of forest health which focuses on restoring or maintaining natural ecological processes and stand structures.

Visual Management

The landscape-level TRD process incorporates a visual component to ensure design units fit well within the natural landscape. The shape of harvesting units will reflect the quality of natural shapes found in the landscape. Harvesting activities will be designed so that visual impacts are absorbed over a period of time and are well distributed.

Recreation

WADF experiences significant recreational use as a result of its proximity to Kokanee Glacier Park, Kootenay Lake, and the City of Nelson. It has a number of interesting recreational features, both developed and undeveloped.

Objectives for managing recreation values in WADF are to:

- Protect significant features of recreational value.
- Disperse recreational use over the area in an ecologically sensitive manner.
- Ensure compatibility of recreational activities throughout the area.

Figure 2. Partial cutting using horses in WADF.

Wildcrafting

Wildcrafting is the collecting of wild plants for purposes such as floristry, landscape products, medicine, and food. Wildcrafting activities can be divided into four general categories: recreational, personal use, supplying local markets; and supplying commercial markets. In WADF, the intent is to:

- Recognize wildcrafting as an ongoing forest use that is of local significance and value.
- Identify which plant species occur or are suspected to occur on a site.
- Maintain the identified wildcrafting resources, and incorporate wildcrafting opportunities into the forest management process.

WATER RESOURCE

There are 301 registered water licenses on streams and springs in WADF. According to an inventory done in March 1998, the major drainages are Bradley, Laird, Kitto, Bagley, Redfish, and Kokanee Creeks. Bradley Creek is licensed as a Community Watershed. There are also a number of licensed springs and intermittent streams on face units (e.g. Bradley Face). The majority of the watersheds are being used for domestic water consumption.

Objectives

Objectives for managing water resources in WADF are to:

- Consider water to be the highest priority resource.
- Maintain quality, quantity, and timing of water flows sufficient for fisheries, domestic, and agricultural uses.
- Ensure peak flows are not increased and low flows are not decreased by management activities.
- Preserve the functioning of riparian areas.
- Maintain present soil moisture regimes, to support naturally occurring forest productivity.
- Demonstrate improved management and assessment alternatives not included in Forest Practices Code guidebooks.

Participation

Licensed water users or their representatives will have the opportunity to participate in the operational planning, decision making, and monitoring of any activities within their watershed through their Watershed Committee.

Road construction and harvesting activities are proposed by the WADF Working Committee, and then proposals are sent to the relevant Watershed Committee for consideration. Watershed Committees will oversee assessments for specific watersheds (both creeks and face units) where operations are planned. Assessments will be completed prior to any work being recommended by the Working Committee. Watershed Committees may also carry out field inspections of these authorized forest development activities.

Management Practices for Water

Areas along major streams that require enhanced riparian management are identified in the TRD as Riparian Management Areas (RMAs). These are part of the FEN. The intent is to provide a significant level of protection to the major streams within WADF, and to ensure corridors are maintained to allow the long-term movement of plants and animals from lower elevations to higher elevations of the forest. Smaller streams have a significant amount of riparian protection within the stream draws.

Additional protection of the water resource will be achieved by applying the following objectives for the planning, construction, and maintenance of roads:

- Reduce the overall area of roads in WADF through access management.
- Minimize the impacts of roads on water quality through detailed planning, careful construction techniques, good road maintenance, and deactivation.
- Minimize the environmental impacts of roads on soils, wildlife, recreational opportunities, and views.
- Minimize the loss of productive sites to roads.
- Demonstrate the latest concepts in minimum impact road construction, maintenance, deactivation, and monitoring.

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Copies of the complete *Strategic Plan for the West Arm Demonstration Forest (Version 1)* are available from the Kootenay Lake Forest District office.